



Macroinvertebrate Monitoring Factsheet

Watershed Management Division biologists measure the condition of the macroinvertebrate populations in running waters as a direct measurement of the aquatic biota which inhabit Vermont's surface waters. This is done to ensure that Vermont's goals for clean water are met.

Metrics

Several population characteristics (called *metrics*) are calculated to determine the health of the species inhabiting the stream bottom. Metric values are compared to those that would be expected in a naturally occurring population in a stream of similar size and location. The community health or *biological integrity* of macroinvertebrate population is considered to be higher the more closely it resembles the natural condition.

- **Density** – Relative Abundance of Macroinvertebrate
- **Richness** – Number of distinct taxa
- **EPT Richness** – Number of distinct taxa from the general more environmentally sensitive orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)
- **PMA-O** Percent Model Affinity of Orders – A measure of order-level similarity to a model based on the reference streams and is an indicator of taxonomic structure
- **B.I.** – Hilsenhoff Biotic Index – The BI is a measure of the macroinvertebrate assemblage tolerance toward organic (nutrient) enrichment and is an indicator of tolerance/intolerance
- **Percent Oligochaeta** – Is a measure of the percent of the macroinvertebrate community made up of the order Oligochaeta and is an indicator of tolerance/intolerance
- **EPT/EPT + Chironomidae** – Is a measure of the ratio of the abundance of the intolerant EPT orders to the generally tolerant Diptera family Chironomidae and is an indicator of taxonomic structure and tolerance/intolerance
- **PPCS-F** – Pinkham-Pearson Coefficient of Similarity - Functional Groups – Is a measure of functional feeding group similarity to a model based on the reference streams and is an indicator of functional structure

Assessments

Looking at all of the metrics, the biologists develop assessments that range from *poor* to *excellent*, which correspond to a highly degraded to near natural condition respectively. The minimum acceptable condition is *good*, which corresponds with the Vermont Water Quality Standards goals for Class B waters. An *excellent* assessment is consistent with Class A1 (ecological waters).

Additional Information

A more detail description of the assessment methodology can be found here:

http://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs_wadeablestream1b.pdf